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Polyetheretherketone PEEK

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Common Brand Names:

Victrex, Zyxex

General Description:

General Description : A high performance thermoplastic with characteristics common to this group - strong, stiff, hard, temperature resistance, good chemical resistance and inh flammability and smoke emission. PEEK is amber in color semi-crystalline and opaque, except thin films are usually and transparent. It also has very good resistance to wear fatigue and radiation, but it is difficult to process and very Filled grades, including ones designed for bearing-type ap are also available as special order items.

Applications include flexible PCBs (film), fibers and monof injection moulded engineering components and items use aerospace and radiation environments.

Chemical Resistance

Acids - concentrated	Fair
Acids - dilute	Good
Alcohols	Good
Alkalis	Good
Aromatic hydrocarbons	Good
Greases and Oils	Good
Halogens	Good
Ketones	Good

Electrical Properties

Dielectric constant @1MHz	3.2-3.3 @ 50Hz-10Kh
Dielectric strength (kV mm ⁻¹)	19 @ 50µm
Dissipation factor @ 1MHz	0.003
Volume resistivity (Ohmcm)	10 ¹⁵ -10 ¹⁶

Mechanical Properties

Coefficient of friction	0.18
Elongation at break (%)	50
Hardness - Rockwell	M99
Izod impact strength (J m ⁻¹)	85
Poisson's ratio	0.4
Tensile modulus (GPa)	3.7-4.0
Tensile strength (MPa)	70-100

Physical Properties

Density (g cm ⁻³)	1.26 - 1.32
Flammability	V-0 @ 1.5mm

Limiting oxygen index (%)	35
Radiation resistance - Alpha	Good
Resistance to Ultra-violet	Fair
Water absorption - equilibrium (%)	0.5
Water absorption - over 24 hours (%)	0.1-0.3

Thermal Properties

Coefficient of thermal expansion ($\times 10^{-6} \text{ K}^{-1}$)	47/108
Heat-deflection temperature - 0.45MPa (C)	>260
Heat-deflection temperature - 1.8MPa (C)	160
Specific heat ($\text{J K}^{-1} \text{ kg}^{-1}$)	320
Thermal conductivity ($\text{W m}^{-1} \text{ K}^{-1}$)	0.25 @ 23
Upper working temperature (C)	250

Properties Polyetheretherketone Film

Property		Value
Density	g cm^{-3}	1.26 - amorphous
Dielectric Constant @ 1MHz		3.3
Dielectric Strength @25 μm thick	kV mm^{-1}	110-150
Dissipation Factor @1MHz		0.005
Extension to break - Longitudinal	%	240
Extension to break - Transverse	%	240
Flammability		VTM-1 @ 0.1mm
Initial Tear Strength	$\text{g } \mu\text{m}^{-1}$	35-50
Permeability to Oxygen @25C	$\times 10^{-13} \text{ cm}^3 \cdot \text{cm cm}^{-2} \text{ s}^{-1} \text{ Pa}^{-1}$	0.06-0.1
Permeability to Water @25C	$\times 10^{-13} \text{ cm}^3 \cdot \text{cm cm}^{-2} \text{ s}^{-1} \text{ Pa}^{-1}$	160-300
Shrinkage	%	0.5 @150C
Specific Heat	$\text{kJ kg}^{-1} \text{ K}^{-1}$	1.45
Tensile modulus - Longitudinal	GPa	2.6
Tensile modulus - Transverse	GPa	2.6
Tensile strength - Longitudinal	MPa	120
Tensile strength - Transverse	MPa	120

Properties Polyetheretherketone Fiber

Property		Value
Specific Tenacity	cN/tex	61
Density	g cm^{-3}	1.30
Extension to break	%	19
Modulus - 10 %	GPa	4.2
Modulus - 2 %	cN/Tex	500
Modulus - 2 %	cN/Tex	500
Modulus - 5 %	GPa	4.35
Shrinkage @180C	%	1.1
Tenacity - Knot	cN/Tex	36
Tenacity - Loop	cN/Tex	40
Tensile strength	MPa	790

Properties Polyetheretherketone Monofilament

Property		Value		
Material		Type A	Type B	Typ
Density	g cm^{-3}	1.30	1.30	1.30
Extension to break	%	38	35	20
Modulus - 10 %	GPa	1.85	2.8	3.4

Modulus - 2 %	cN/Tex	382	438	474
Modulus - 2 %	cN/Tex	382	438	474
Modulus - 5 %	GPa	2.7	3.7	3.9
Shrinkage @180C	%	1.8	8.4	3.0
Tenacity - Knot	cN/Tex	28	23	34
Tenacity - Loop	cN/Tex	25	19	17
Tenacity	cN/Tex	34	30	60
Tensile strength	GPa	0.44	0.39	0.78

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